



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/045,036	01/15/2002	Toshihiko Tanaka	XA-9613	2902

7590 09/29/2003

Miles & Stockbridge P. C.
1751 Pinnacle Drive, Suite 500
McLean, VA 22102-3833

EXAMINER

PHAN, THIEM D

ART UNIT	PAPER NUMBER
----------	--------------

3729

DATE MAILED: 09/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/045,036

Applicant(s)

TANAKA ET AL.

Examiner

Tim Phan

Art Unit

3729

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 9-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicants' election with traverse of Group I (Claims 1-8) in Paper No. 5 is acknowledged. The traversal is on the ground(s) that the examiner has not established a prima facie case of serious burden of examination of the inventions of all claims in Groups I and II together. This is not found persuasive because the examiner has established a prima facie case having shown in Paper No. 4, that the invention of all claims in Group I, claiming a process of making a circuit board with mounting components, has a separate classification (Class 29, subclass 832) from the invention of all claims in Group II (Class 29, subclass 846) which claims a process of making a multilayer-circuit board. Moreover, the inventions of Groups I and II each have a separate status in the art and clearly have a separate field of search.

In accordance with MPEP § 803, the examiner has demonstrated that the inventions of Groups I and II are each independent or distinct as claimed (indicated in Paper No. 4) and a serious burden would be placed on the examiner as discussed above. The requirement is still deemed proper and is therefore **made FINAL**.

Claims 9-17 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected Group II, there being no allowable generic or linking claim.

Applicants are required to cancel these nonelected Claims (9-17) or take other appropriate action.

An Office Action on the merits of Claims 1-8 now follows.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In "... an area of said shade pattern ... smaller ... no shade pattern" (claim 4, lines 3-5), the area of shade pattern can be larger or smaller than the one of non-shade pattern (Cf. Applicants, Fig. 1B, element 2).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hatakeyama et al (US 6,007,969) hereinafter '969.

The '969 teaches, as a prior art, a method of microfabricating a circuit which reads on applicants' claimed limitations, including a step of making ultrafine ditch for conductive trace (Cf. Fig. 15E, element 1c) on a base using a light beam and photomask (Cf. Fig. 15B, elements 4 & 3) except for describing the photomask to be made of nano particles.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the photomask made of nano particles since it was know in the art that nano particles (Cf. Fig. 3A, element 22) have been used for shielding in an improved invention.

6. Claims 2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over the '969 in view of May et al (US 4,465,749) hereinafter '749.

Art Unit: 3729

The '969 teaches a method of microfabricating a circuit which reads on all of applicants' claimed limitations.

The '749 teaches that the toner to be employed as a mask (Cf. column 2, line 16) is made of carbon-black-pigmented (CF. column 6, lines 4-6) at 20% (Cf. column 12, line 66).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the two teachings and to apply the toner-mask made of carbon pigment (as taught by the '749) at higher ratio and nano size in order to enhance the masking accuracy.

7. Claims 3, 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over the '969 in view of Takahiro et al (JP 05-289307) hereinafter '307.

As applied to claim 3, the '969 teaches a method of microfabricating a circuit which reads on applicants' claimed limitations.

The '307 teaches, as old art, the highly precise production of wiring (Cf. Fig. 5 a-d, element 51) by photosensitive film (Cf. Fig. 5, element 12) and etching.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the two teachings and to apply the making of conductive tracks (as taught by the '307) with a negative photosensitive film, which is also old in the art, in order to get the wiring corresponding to shade pattern or a photosensitive film to get a reverse through the light exposure mask.

Art Unit: 3729

As applied to claim 4, further rejected under 35 U.S.C. 103(a), the '969 and '307 teaches the claimed invention except for having an area of shade pattern relatively smaller than an area of a light transmission region with no shade pattern.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to create an area of shade pattern relatively smaller than an area of a light transmission region with no shade pattern since it was known in the art that the photomask can be patterned from regular size track to nano size one.

As applied to claim 5, the '969 teaches the etching through the photosensitive film (Cf. Fig. 15D, element 2) to form a via in the bottom layer (Cf. Fig. 15D, element 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to fill the via with conductive material to make connection between layers of circuit board.

8. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over the '969 in view of the '307 and further view of Kunimichi et al (JP09-321184) hereinafter '184.

The '969 and '307 teach a method of microfabricating a circuit which reads on applicants' claimed limitations.

The '184 teaches the mounting of electronic components (Cf. Fig. 1, element 20 or Fig. 5) on one side of the microcircuit board as an interposer (Cf. Fig. 1, element 10) and the main printed circuit board (Cf. Fig. 1, element 30) on the other side.

Art Unit: 3729

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the three teachings and to apply the mounting structure (as taught by the '184) in order to create an interposer that matches/ connects the ultrafine and dense circuit of the chips to the normal size circuit of the PCB.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tim Phan whose telephone number is 703-605-0707. The examiner can normally be reached on M - F, 9AM - 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 703-308-1789. The fax phone numbers for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 3729

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1148.

TP

Tim Phan
Examiner
Art Unit 3729


CARL J. ARBES
PRIMARY EXAMINER

tp
September 24, 2002